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# **WATER SUPPLY OUTLOOK FOR WASHINGTON**

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**MAR 3 - 1967**

**and**  
**FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS**

**CURRENT SERIAL RECORDS**

**UNITED STATES DEPARTMENT of AGRICULTURE - SOIL CONSERVATION SERVICE,**

**and**

**DEPARTMENT of CONSERVATION STATE of WASHINGTON**

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, and other Federal, State and Private organizations.

**AS OF  
FEB. 1, 1967**

## TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season as they affect runoff will add to be an effective average. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data or reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

Listed below are water supply outlook reports based on Federal-State-Private Cooperative snow surveys. Those published by the Soil Conservation Service may be obtained from Soil Conservation Service, Room 507, Federal Building, 701 N. W. Glisan, Portland, Oregon 97209.

### PUBLISHED BY SOIL CONSERVATION SERVICE

D. A. WILLIAMS, Administrator

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 507, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85205
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80202
Idaho	P. O. Box 38, Boise, Idaho 83701
Montana	P. O. Box 855, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4001 Federal Building, Salt Lake City, Utah 84111
Washington	840 Bon Marche Bldg., Spokane, Washington 99206
Wyoming	P. O. Box 340, Casper, Wyoming 82602

### PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



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FEDERAL-STATE-COOPERATIVE  
SNOW SURVEY AND WATER SUPPLY FORECASTS

For

WASHINGTON

Report Prepared  
By

Robert T. Davis, Snow Survey Supervisor

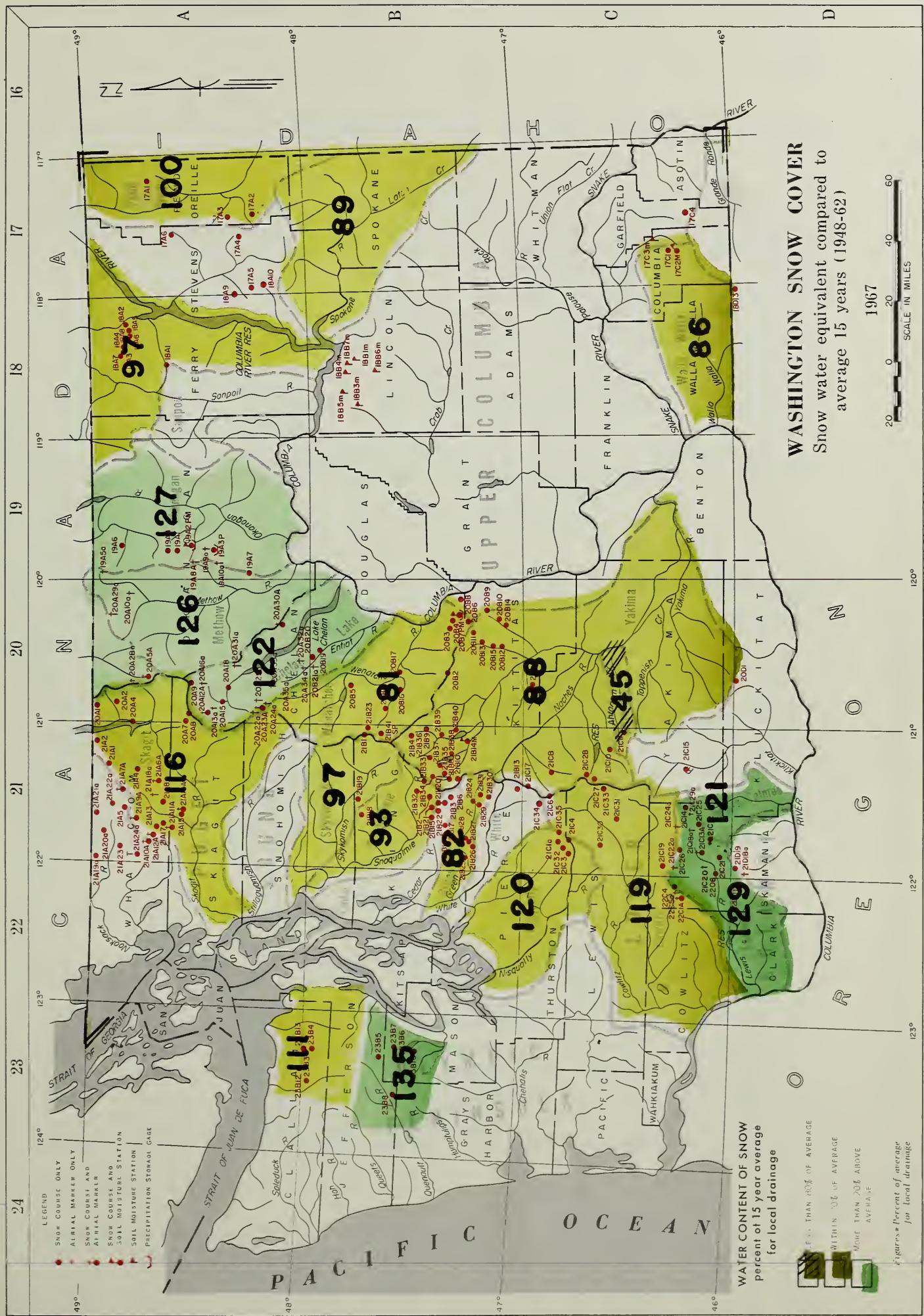
Soil Conservation Service  
840 Bon Marche Building  
Spokane, Washington

Issued By

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U. S. Department of Agriculture

H. W. Pollock, Supervisor  
Division of Water Resources  
Department of Conservation  
State of Washington





# INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS, and PRECIPITATION GAGES

NAME	NUMBER	SEC.	TOP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TOP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TOP.	RANGE	ELEV.
<b>UPPER COLUMBIA DRAINAGE</b>																	
Pend Oreille River						Squillchuck Creek	2083	12	21N	19E	4400	Divide Meadow	21029a	21	2N	10E	5600
Boyer Mountain	17A2	7	31N	43E	5250	Scout-A-Vista	2084	18	21N	20E	3400	Grand Meadow	21025	28	2N	9E	3500
Bunyartes Meadow	17A1	24	33N	44E	5000							Lone Pine Shelter	21026	8	9N	7E	3680
Winchester Creek	17A3	30	33N	43E	2970	Jump-Off	2088	34	21N	20E	4450	Marble Mountain	2205a	24	8N	5E	3800
Kettle River						Stenlit Slide	2086	30	21N	20E	5000	New Muddy River	2206	36	8N	6E	3500
Boulder Road	18A2	36	39N	36E	1450	Upper Wheeler	2087PM	30	21N	20E	4400	Oldman Pass	21019	22	6N	7E	5000
Butte Creek	18A3	28	39N	35E	4070	Croft Creek	1883m	32	27N	34E	2440	Plains of Abraham	2202a	35	9N	5E	2600
Cabin Creek	18A4	5	39N	36E	3170	Gretton-Kunz	1883m	28	27N	31E	2750	Smith Creek Road	2202a	29	9N	6E	1900
Goat Creek	18A5	26	39N	35E	3595	Jack Woods	1883m	27	27N	31E	2420	Spencer Meadow	21020a	16	8N	7E	4200
Snow Caps Creek	18A6	3	38N	36E	2120	Krause	1885m	17	27N	32E	2378	Dock Butte	21011a	8	36N	8E	3800
Snow Caps Trail	18A7	5	38N	36E	2720	Sheffels	1887m	24	27N	33E	2440	Easy Pass	2107a	19	39N	11E	5200
Summit G. S.	20	39N	35E	4600	Sherman	1886m	24	25N	32E	2290	Jasper Pass	2106a	23	38N	8E	3600	
Wheatridge												Marten Lake	2109a	23	38N	8E	3600
Baird	17A1	19	36N	42E	3215	Ahtanum R. S.	21011	26	12N	14E	3100	Mount Blum	21018a	27	38N	10E	5800
Carlson	18A9	34	32N	38E	2885	Big Boulder Creek	21019	35	23N	14E	3200	Rocky Creek	21013a	20	37N	8E	3400
Chavelah	17A4	11	32N	41E	4925	Bumping Lake	21018	23	16N	12E	2450	Schreiber's Meadow	21010a	18	40N	7E	5100
Stranger Mountain	17A5	26	31N	38E	4990	Clockum Pass	2089	25	20N	20E	2370	S. F. Thunder Creek	21012a	21	36N	9E	2200
Togo	18A10	6	29N	38E	3370	Cooke Creek	20810	17	19N	20E	4123	Sulphur Creek	21013	22	37N	8E	1600
Sonopil River	18A1	10	36N	35E	5330	Cooper Pass	21036	33	23N	13E	3300	Three Mile Creek	21015	18	36N	9E	1600
Sherman Creek Pass						Fish Lake	21014	34	24N	14E	3371	Twin Lakes	21030	3	13N	8E	4500
Okanogan River						Green Lake	21010	3	12N	13E	6000	Bald Mountain	21019a	7	40N	7E	4400
Clark	19A8a	2	36N	23E	7000	Grouse Camp	20811	29	21N	19E	5385	Canyon	21023	29	40N	8E	5100
Nuckanuck	19A9a	20	36N	24E	6750	High Creek	20812	34	20N	19E	2930	Glacier Creek	21023	9-10	38N	7E	3700
Nutton Creek No. 1	19A1	30	37N	24E	5700	Hayak	21034	15	22N	11E	2600	Hannegan Pass	21022a	8	39N	9E	5000
Mutton Creek No. 2	19A2a	32	40N	18E	6000	Hachess Peninsula	21038	34	21N	13E	2220	Mazama Park	21024a	2	37N	7E	4500
Payson	19A3P	18	35N	24E	4000	Lake Cleft	21037	32	22N	13E	2280	Panorama	2105	17	39N	9E	4300
Rusty Creek	19A4P	33	37N	24E	4500	Lake Elum	21014M	15	17N	16E	2935	Twin Lakes	21021a	16	40N	9E	5200
Salmon Meadows	19A2P	15	35N	23E	6750	Mansatash	20811	20	19N	20E	2320	Ghost Forest	21024	23	15N	8E	4550
Starvation Mtn.	19A10a	30	39N	25E	2845	Morgan Creek	21017	6	16N	11E	5400	Longmire	21033	13	15N	8E	2760
Touts Coulee	19Ab					Moraine Lake	20813	4	20N	19E	3875	Paradise Park (New)	21011	13	15N	8E	5050
Billy Coat Pass	20A10a	10	38N	20E	6400	Nobles Creek	21035	10	21N	12E	2520	Stem Clade	21013	13	15N	8E	4550
Dollar Watch	20A29a	8	39N	20E	7000	Salmon La Sac	21039	16	22N	14E	2340	White River Campground	21034	4	16N	9E	5000
Harts Pass	20A54a	7	37N	18E	6500	Snoqualmie Pass	21033	4	22N	11E	3020	Corral Pass	21013	30	18N	11E	6000
Horsehoe Basin	19A5a	15	40N	23E	7000	Tunnel Avenue	20814	20	19N	20E	30360	White River	21034	4	16N	9E	5200
Loup Loup	19A7	36	34N	23E	4650	Walters Flat	20815	22	21N	11E	2450	Green River	21024	18	20N	11E	4500
<b>CHETON LAKE BASIN</b>																	
Cloudy Pass	20A22a	12	31N	15E	6500	Airstrip	21035	10	21N	14E	2520	Charley Creek	21025	27	21N	8E	4850
Greenwood Flat	20A25a	3	31N	16E	3540	Grass Mountain No. 1	21025	31	20N	8E	4000	Grass Mountain No. 2	21027	14	20N	8E	5425
Little Meadows	20A29a	18	31N	16E	5275	Lester Creek	21028	3	21N	12E	2020	Grass Mountain No. 3	21027	12	20N	8E	2900
Lyman Lake						Sawmill Ridge	21029	36	20N	10E	3100	Black and White Lakes	21027	17	24N	5W	4500
Park Creek Flat	20A13a	18	34N	16E	2220	Stampede Pass	21031	5	19N	11E	4700	Four Stream	21010	25	23N	6W	4700
Petersons Pass	20A16a	3	34N	17E	4600	Twin Camp	21030	18	19N	11E	4100	Home Sweet Home	21025	28	25N	5W	3000
Rainy Harbor	20A19a	21	35N	17E	4780							Sundown Pass	2108	25	21N	7W	2900
War Creek Pass	20A30a	32	31N	20E	6300												
<b>ENIAT RIVER</b>																	
Brief Meadow	21B19	34	28N	19E	1600	Coose	1763m	2	9N	25E	3370	Cedar River	21013	10	21N	10E	2390
Eniati River	20A33a	28	31N	17E	4800	Homestead	1761	11	9N	20E	4030	City Cabin	21024	18	22N	10E	3300
Chiawakum C. S.	20A24a	2	29N	17E	3120	Martin Springs (Helmers SM)	1762M	23	9N	40E	4400	Mt. Gardner Aux.	21021	30	22N	10E	2500
Lake Nenatchee	20B16	4	25N	17E	1810	Walla Walla Diversion	18013	22	6N	38E	24200	Mt. Lindsay	21016	31	22N	9E	2500
Pope Ridge	20B20	22	29N	18E	4300							Mt. Washington	21015	8	22N	9E	3000
Pugh Ridge	20A32a	34	30N	18E	6400	Satus Pass (East Side)	21028	2	13N	11E	4500	Rex River	21017	11	21N	10E	2400
Snow Brushy	20A35a	21	30N	17E	3850	White Pass (Leach Lake)	21027	1	13N	11E	3000	South Fork Cedar	21020	1	21N	10E	3400
Tommy Creek	20B21a	10	28N	18E	5300							Tinkham Creek	21021				
<b>WENATCHEE RIVER</b>																	
Berne-Mill Creek	21B23	7	26N	15E	2925	White Salmon River	21C12	35	7N	8E	4000	Snoqualmie River	21032	16	22N	10E	1635
Berne-Mill Creek (New)	21B14SP	13	26N	14E	3240	Cultus Creek	21032	10	21N	10E	4270	Olallie Meadows	21022	19	22N	11E	3625
Blewett Pass No. 2	20B16	35	22N	17E	1810							South Fork Tolt	21018	26	26N	9E	1900
Lake Nenatchee	20B5	33	27N	17E	1970	Blue Lake	21C22a	19	9N	8E	4800						
Pope Ridge	20B17	1	24N	17E	1127							Blodell	21C21	25	8N	7E	2200
Leavenworth R. S.	20B18	4	26N	16E	2110							Popes	22D1a	8	5N	2500	
Merritt Pass	21B1	14	26N	13E	4070								21B15	1	21N	10E	
Stevens Pass													21B16	24	21N	10E	
Berne-Mill Creek	21B13a	24	9N	9E	4200								21B17	1	21N	10E	
Berne-Mill Creek (New)	21B13a												21B18	1	21N	10E	
Blewett Pass No. 2	20B16												21B19	33	26N	10E	2900
Lake Nenatchee	20B5												21B20				
Pope Ridge	20B17																
Leavenworth R. S.	20B18																
Merritt Pass	21B1																
Stevens Pass																	
<b>LOWER COLUMBIA DRAINAGE</b>																	
Klickitat River	2001	21	6N	17E	4030												
Asotin Creek	21C15	23	9N	12E	5700												
Spruce Springs																	
Mill Creek																	
Couse	1763m	2	9N	25E	3370												
Homestead	1761	11	9N	20E	4030												
Martin Springs (Helmers SM)	1762M	23	9N	40E	4400												
Walla Walla Diversion	18013	22	6N	38E	24200												
<b>LOWER COLUMBIA DRAINAGE</b>																	
White Salmon River	21C12	35	7N	8E													

## WATER SUPPLY OUTLOOK

February 1, 1967

### SNOW COVER

All of the watersheds in the Upper Columbia Basin of Washington have a snowpack that is normal to well above for this time of year. Watersheds where high elevation snow courses are predominant, such as the Chelan, Cowlitz, Nisqually and Skokomish, indicate well above normal snowpacks. Those watersheds where the February 1 snow is measured at lower elevations, such as the Klickitat and Ahtanum, have a very low snowpack. Where there seems to be a balance of high and low snow courses the comparison of snowpacks with average is near the normal mark.

## RESERVOIRS

With the exception of Coeur d'Alene Lake in the Spokane River watershed and Ross Reservoir on the Skagit River power reservoirs have less than normal amounts of water in storage. With the exception of Conconully Reservoir, Salmon Lake and Rimrock Lake, irrigation reservoirs have more water in storage than normal. Comparing the reservoir water situation with last year the situation is very much improved. With the amount of space left in the reservoir pools and the expected runoff from the high elevation snowpacks all reservoirs are expected to comfortably fill during the forthcoming runoff season.

## PRECIPITATION

Fall precipitation was generally close to normal with the central part of Washington having the least amount of precipitation and the



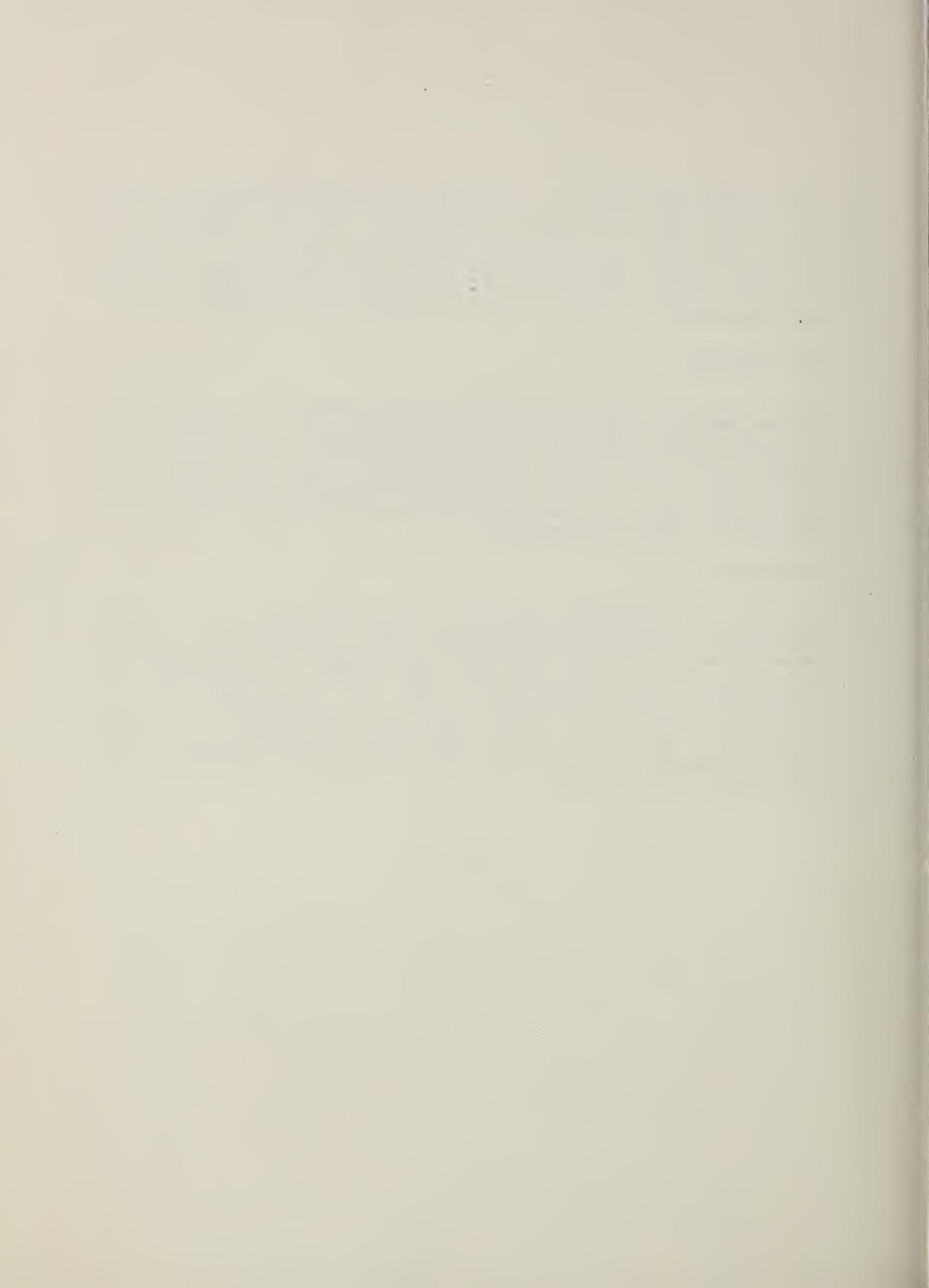
north central the most. As the winter developed December had better than normal rainfalls in the valleys again with the exception of the central portion. By January the deficit in central Washington was pretty well made up but the north central area this time was slightly less than normal. The winter picture so far for the eight divisions reported in this outlook is for above normal precipitation during the past two months.

#### SOIL MOISTURE

The soil mantles entered the winter period with a soil moisture condition similar to that reported the past two years. By February 1, the situation had generally improved until there is a better moisture content in the soil than was reported both last year and the year before at this time. Two new soil moisture stations were added to the network this year but these stations have insufficient records to be used for any comparison purposes.

#### STREAMFLOW

Forecasts of streamflows are made only for the main stem of the Columbia River as measured at The Dalles. This forecast for the April-September period is for a flow 10% above normal or 119,500,000 acre feet. April - June flow for this same station is expected to be 84,000,000 acre feet or 10% above normal, also. Numerical forecasts of other streams will be made by the Soil Conservation Service and released with the March 1 report when a more thorough analysis of the snowpack conditions and how they relate to valley precipitation and other factors can be made.



COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

The following tabulation of Washington stream basins presents the water content of the snow about February 1, 1967 as per cent of the same date in 1966 and 1965 and average of record.

Tributary Basin	No. of Courses Average	Years of Record	1967 Snow Water Expressed as per cent of 1966 1965 1948-1962 Avg.		
			1967	1966	1965

UPPER COLUMBIA BASIN

Pend Oreille	5 - 8	3 - 30	111	93	100*
Kettle	3 - 13	1 - 27	94	65	97*
Colville	5	5 - 8	54	44	--
Spokane	1 - 5	3 - 22	117	85	89
Okanogan	19 - 24	1 - 29	132	124	127*
Methow	5 - 8	7 - 23	138	130	126*
Chelan	1 - 8	2 - 13	148	120	122*
Entiat	1 - 2	2 - 6	77	58	--
Wenatchee	4 - 12	6 - 22	73	57	81*
Yakima	6 - 14	8 - 45	78	65	88*
Ahtanum	1	25	36	29	45*

LOWER COLUMBIA

Mill Creek	3	13	59	62	86*
Klickitat	2	9 - 10	27	26	--
White Salmon	1	9	100	91	121*
Lewis	4 - 18	4 - 9	79	82	129*
Cowlitz	3 - 8	3 - 15	101	87	119*

PUGET SOUND

Nisqually	3 - 4	1 - 10	140	99	120*
White	1	1	94	--	--
Green	1 - 8	5 - 20	97	70	82*
Snoqualmie	1	17	85	62	93*
Skykomish	1	22	108	76	97*
Skagit	4 - 7	10 - 17	135	122	116*
Nooksack	1	10	135	129	--

OLYMPIC PENINSULA

Skokomish	1 - 5	3 - 9	113	121	135*
Elwha	1	7	130	119	--
Dungeness	1	13	109	134	111*

\* Records of less than 15 years used in computation of average



RESERVOIR STORAGE - 1000 Acre Feet

BASIN or STREAM	RESERVOIR	USUABLE CAPACITY	Measured (February)				Normal*
			1967	1966	1965		
<u>COLUMBIA</u>							
Spokane	Coeur d'Alene Lake	225.1	238.0	53.8	237.5	131.0	
Columbia	Franklin D. Roosevelt Lake	5232.0	3477.2	3170.0	4427.0	4059.3	
Columbia	Banks Lake <sup>2/</sup>	761.8	761.8	506.1	447.6	484.3	
Okanogan	Conconully Reservoir	13.0	3.2	0	4.7	7.0	
Okanogan	Salmon Lake	10.5	3.2	7.8	8.4	8.9	
Chelan	Lake Chelan	676.1	255.0	272.0	334.0	341.0	
<u>YAKIMA</u>							
Yakima	Keechelus Lake	157.8	113.0	76.4	104.6	87.4	
Kachess	Kachess Lake	239.0	186.3	162.8	191.3	171.9	
Cle Elum	Lake Cle Elum	436.9	235.0	186.4	307.1	240.9	
Bumping	Bumping Lake	33.7	5.9	3.2	10.8	10.4	
Tieton	Rimrock Lake	198.0	91.0	82.4	153.9	113.0	
<u>PUGET SOUND</u>							
Skagit	Ross Reservoir <sup>2/</sup>	1202.9	1132.2	867.9	916.5	766.9	
Skagit	Diablo Reservoir	90.6	84.7	85.9	82.9	85.7	
Skagit	Gorge Reservoir	9.8	8.4	7.4	7.5	--	

1/ Based on Active Storage

2/ Less than 15-year record in period 1948-62

\* 15-year average 1948-62



SOIL MOISTURE - FEBRUARY

Drainage Basin and Station	Number	Elev.	Profile	(Inches)	Soil Moisture Content		
			Total Depth	Capacity	1967	1966	1965
<u>CRAB CREEK</u>							
Creston-Kunz	18B1	2440	48	13.6	7.9	5.3	7.7
Jack Woods	18B3m	2600	48	13.6	7.9	7.0	6.7
Krause	18B4m	2440	48	13.6	8.4	6.9	7.4
Sheffels	18B5m	2360	48	13.6	7.5	5.1	5.8
Sherman	18B7m	2440	48	13.6	5.6	--	--
Wheatridge	18B6m	2200	48	13.6	7.8	5.9	6.6
<u>OKANOGAN</u>							
Salmon Meadows	19A2M	4500	48	5.4	3.6	2.1**	--
Trout Creek	3-M	3600	48	7.3	4.3*	3.4	4.0
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	4.9	4.4*	4.9
Lake Cle Elum	21B14M	2200	48	12.8	10.0	8.9*	9.0
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	7.4	7.2	10.1
Helmers	17C2M	4400	48	12.0	10.0	6.8	11.5
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	10.3	8.0	7.2

\* January 1 measurement

\*\* March 1 measurement

FALL SOIL MOISTURE

Drainage Basin and Station	Number	Elev.	Profile	(Inches)	Soil Moisture Content		
			Total Depth	Capacity	1966	1965	1964
<u>CRAB CREEK</u>							
Creston-Kunz	18B1m	2440	48	13.6	5.0	4.9	5.4
Jack Woods	18B3m	2600	48	13.6	4.3	5.0	4.4
Krause	18B4m	2440	48	13.6	5.1	5.8	5.9
Sheffels	18B5m	2360	48	13.6	3.8	4.0	3.7
Sherman	18B7m	2440	48	13.6	3.7	--	--
Wheatridge	18B6m	2200	48	13.6	4.1	4.2	4.1
<u>OKANOGAN</u>							
Salmon Meadows	19A2M	4500	48	5.4	3.0	1.9	--
Trout Creek	3-M	3600	48	7.3	3.8	4.1	4.9
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	2.4	1.9	4.4
Lake Cle Elum	21B14M	2200	48	12.8	6.4	6.9	8.5
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	5.7	6.0	5.6
Helmers	17C2M	4400	48	12.0	6.7	6.2	6.0
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	5.7	6.2	5.3



PRECIPITATION 1/

## Division Averages and Departures

DRAINAGE DIVISIONS	FALL		2/	WINTER	
	Sept-Oct-Nov Average	1966 Departure		Dec. 1966 & Jan. 1967 Average	2/
Columbia in Canada	6.80	+ 0.53		7.70	+ 1.42
Pend Oreille - Spokane	7.75	- 1.19		10.64	+ 2.09
Northeastern Washington	5.29	- 0.02		6.42	+ 1.22
Southeastern Washington	5.33	- 0.54		6.93	+ 1.26
Central Washington	8.93	- 2.94		15.23	+ 1.87
North Central Washington	3.55	+ 0.52		3.65	+ 3.20
Southwest Slope Cascades	15.38	- 2.71		24.40	+ 5.93
Northwest Slope Cascades	20.24	- 3.80		32.20	+ 8.82

Northeastern Washington - Lower Spokane, Colville, Sanpoil and lower Kettle drainages

Southeastern Washington - Touchet, Tucannon and Palouse drainages

Central Washington - Yakima, Wenatchee and Chelan drainages

North Central Washington - Methow and Okanogan drainages

Northwest Slope Cascades - Puget Sound drainages

Southwest Slope Cascades - Lower Columbia drainages

1/ - Preliminary analysis by U. S. Weather Bureau from data furnished by Meteorological Services of Canada and U. S. Weather Bureau

2/ - Departure from 15-year (1948-62) drainage division average

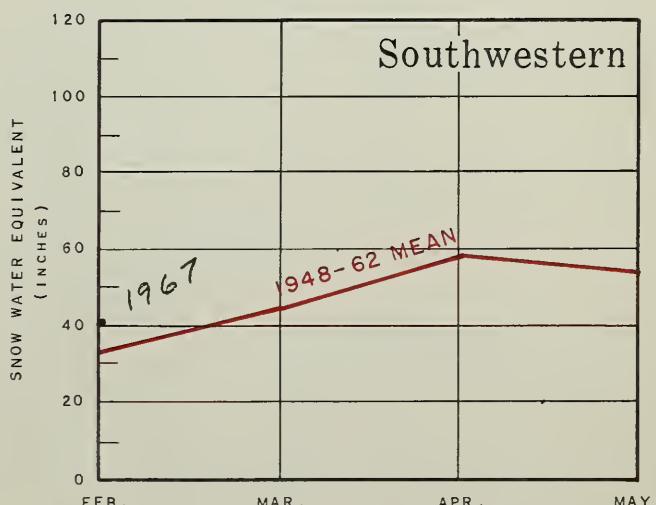
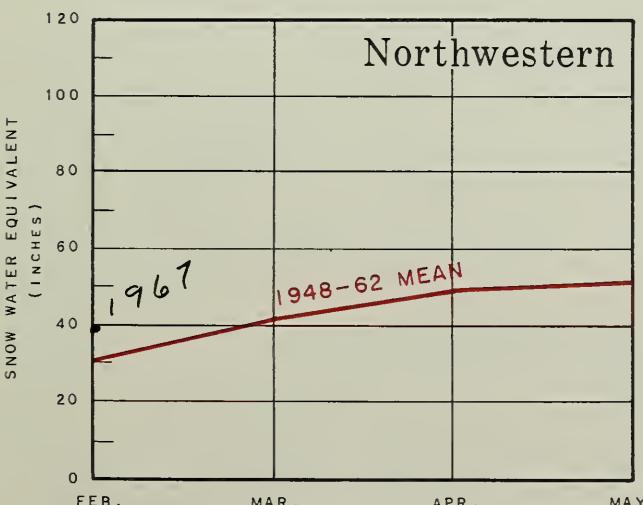
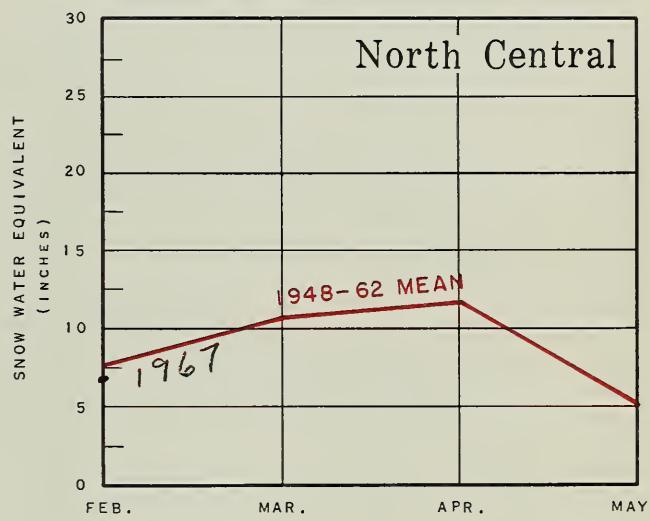
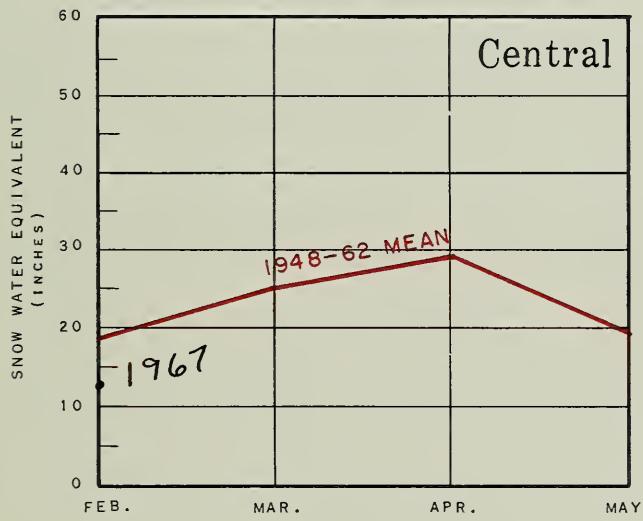
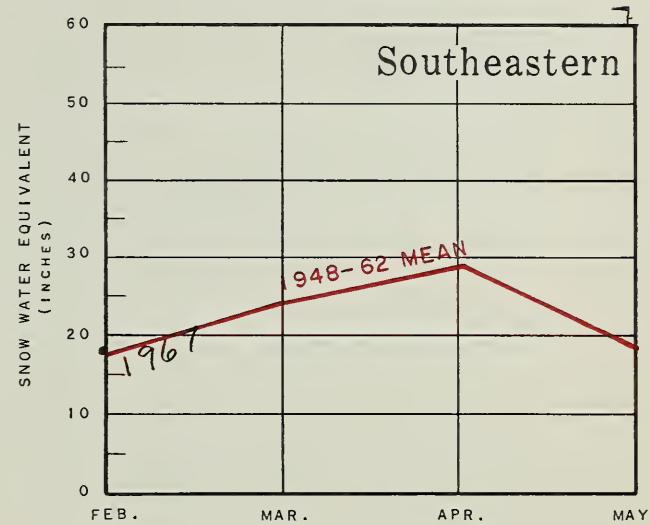
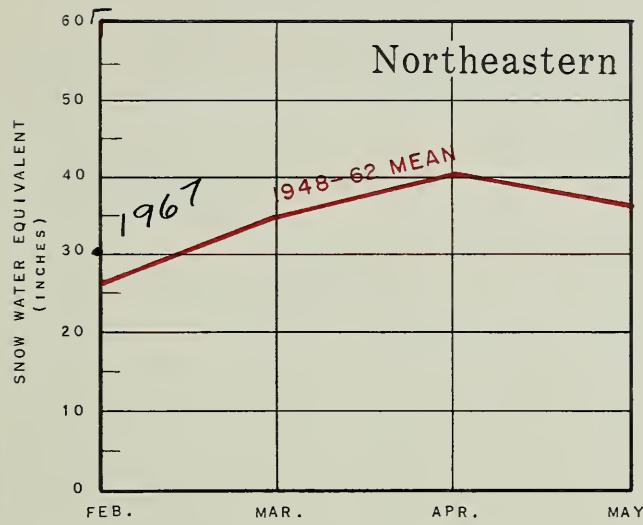
Note - Precipitation shown in inches



# WASHINGTON SNOW COVER

1967

## DRAINAGE AREAS

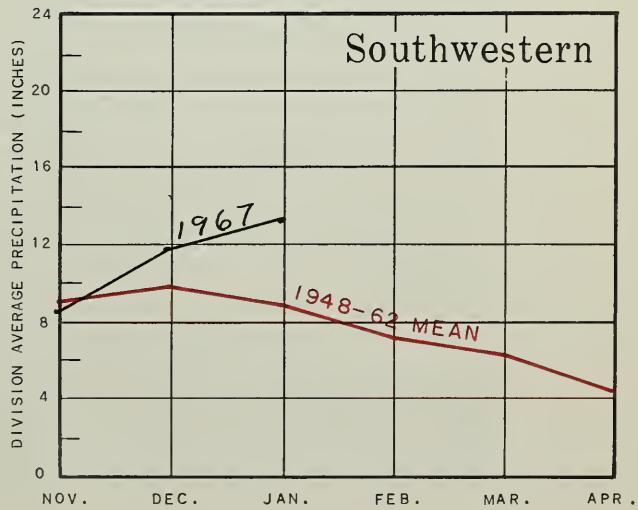
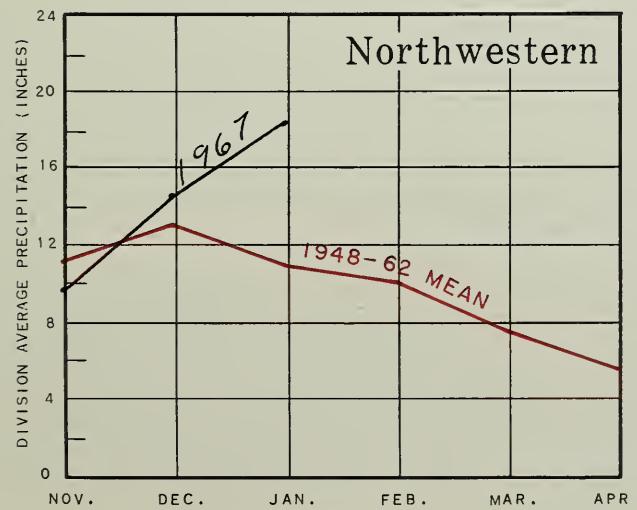
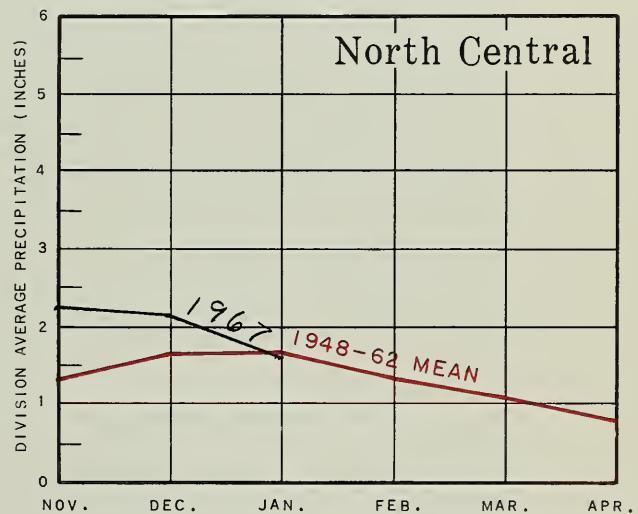
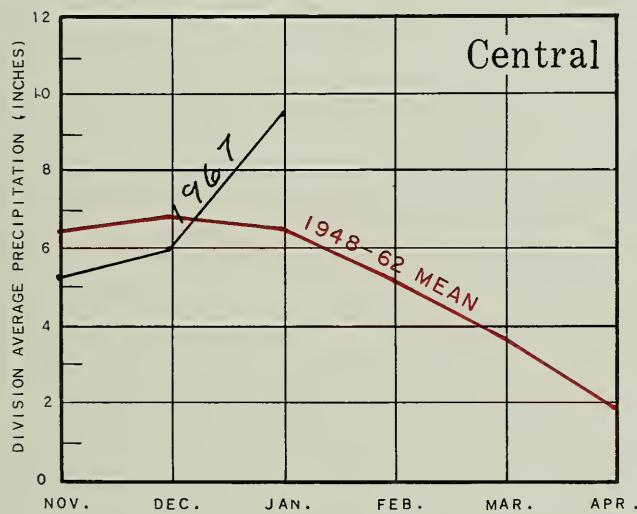
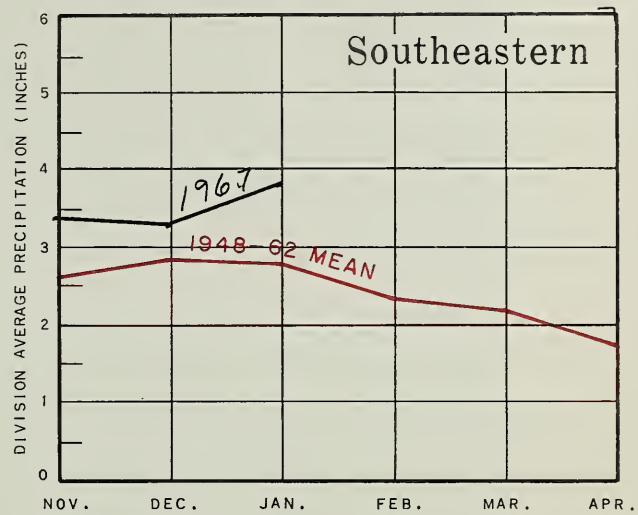
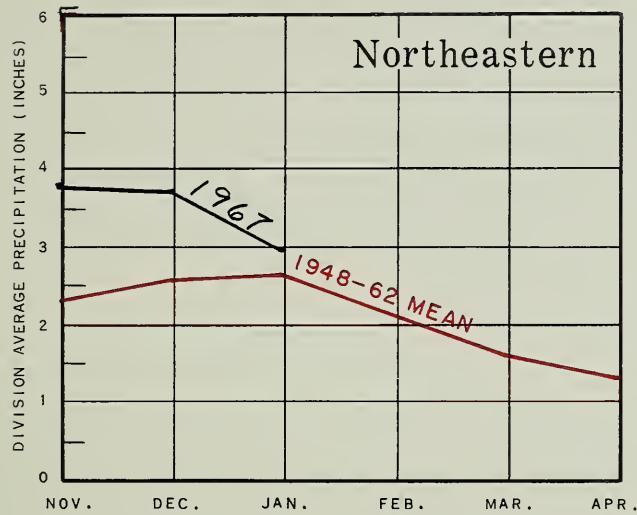




# WASHINGTON VALLEY PRECIPITATION

1966 - 1967

## DRAINAGE AREAS

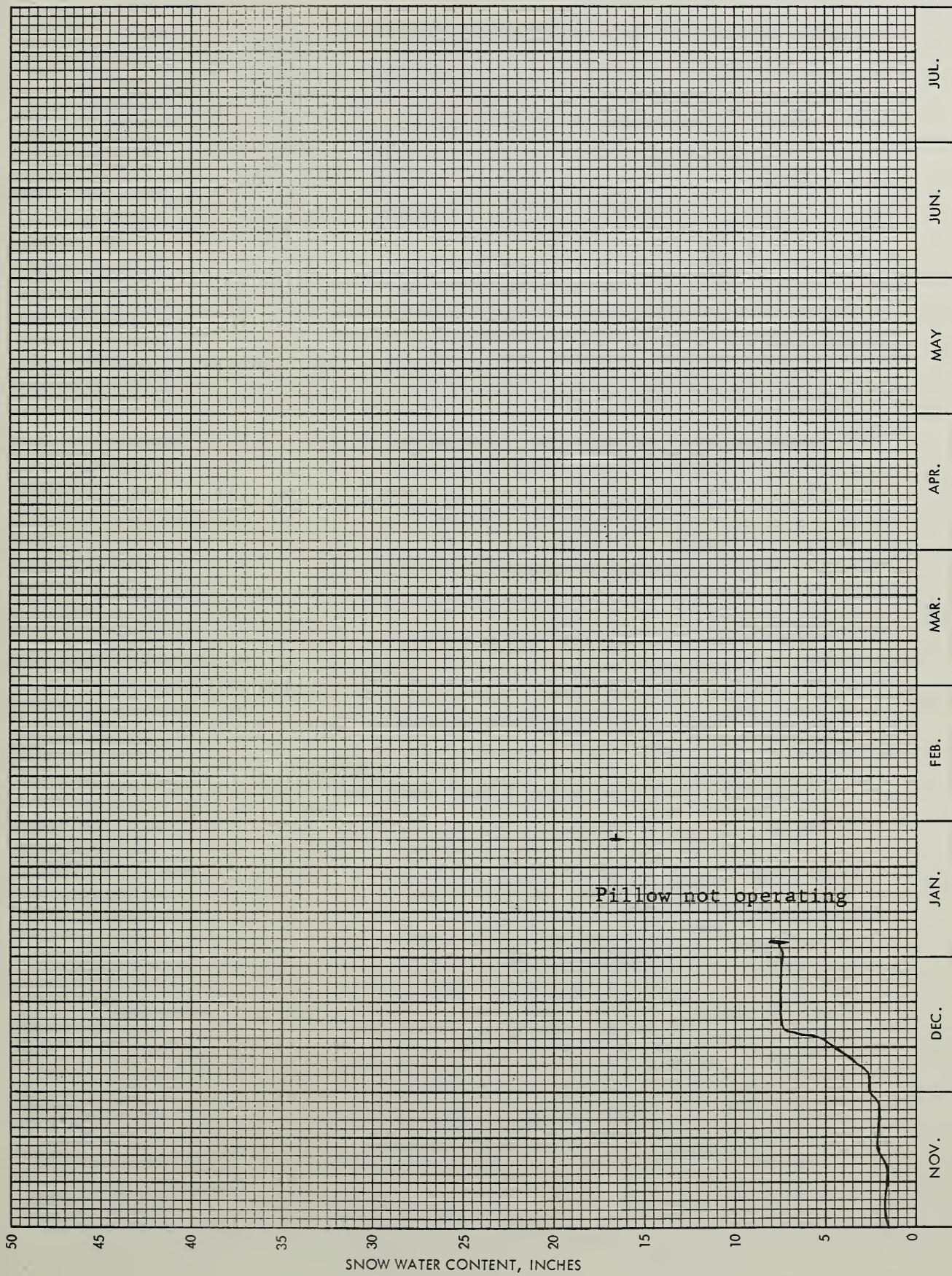




## SNOW PILLOW DATA

Berne-Mill Creek

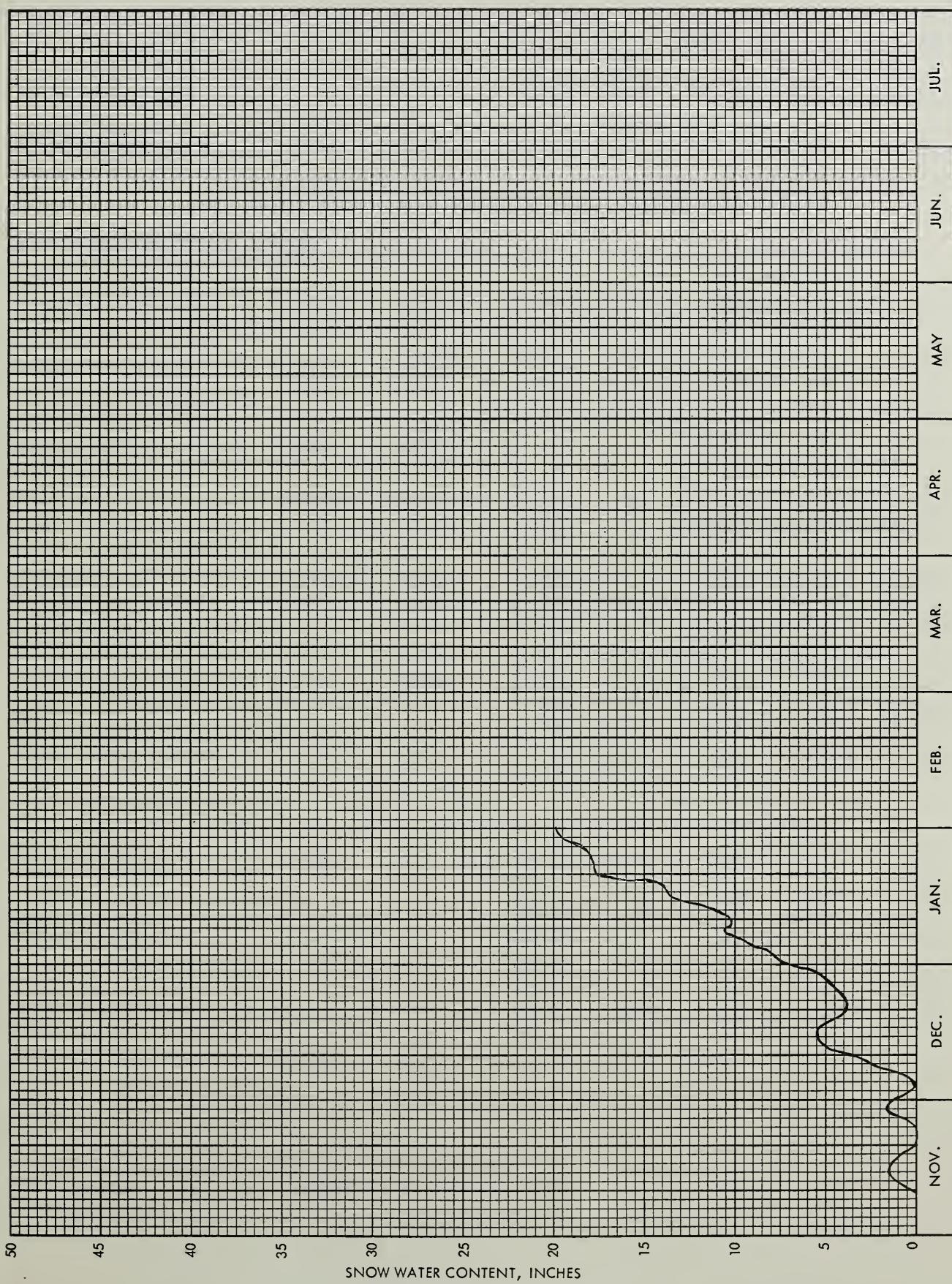
Sec. 13 T. 26N R. 14E No. 21B41SP Drainage: Wenatchee  
Lat. 47° 46' Long. 121° 01' Elev. 3170

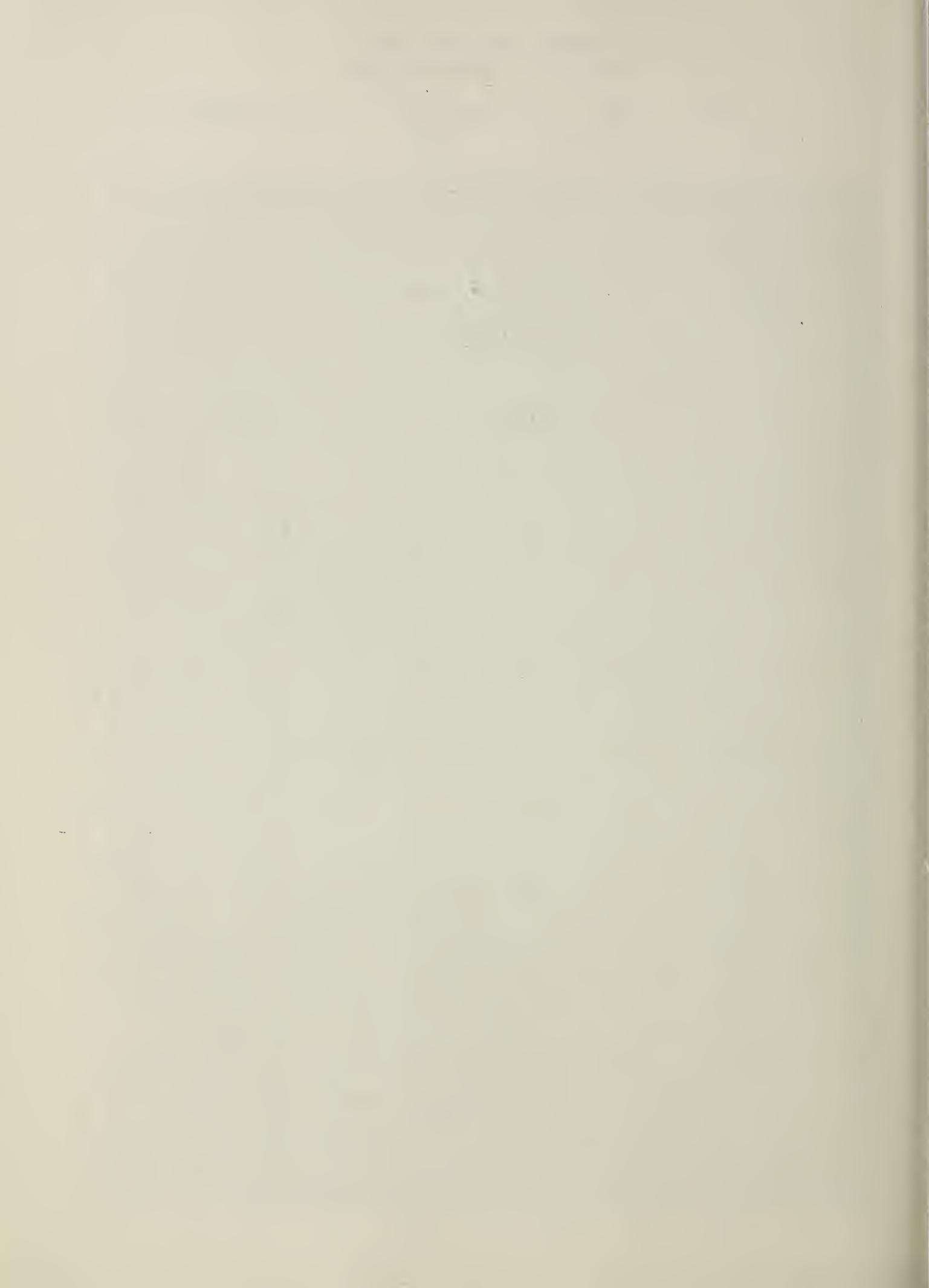




SNOW PILLOW DATA  
EBA Pillow - Snoqualmie Pass

Sec. 4 T. 22N R. 11E No. 21B33SP Drainage: Yakima  
Lat. 47° 25' Long. 121° 25' Elev. 3020





## APPENDIX 1

## SNOW DATA TO FEBRUARY 1, 1967

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT							
			1967		:Past Record					
			Date of Survey (In.)	Snow Depth (In.)	Water Content (In.)	Water Content: 1948-62	1966	1965		
<u>UPPER COLUMBIA DRAINAGE</u>										
<u>PEND OREILLE RIVER</u>										
Benton Meadow	16A2	2344	1/5	12	2.2	5.3	6.1	3.4		
			1/31	10	3.0	6.7	8.9	5.6		
Benton Spring	16A3	4900	12/21	21	6.6	9.1	9.6	9.3		
			1/31	50	16.9	14.1	15.7	14.7		
#Chewelah	17A4	4925	1/30	38	11.5	16.9	18.5	--		
Lookout	15B2	5250	12/29	56	15.6	12.5	17.6	17.6*		
			1/31	94	29.2	21.6	27.7	26.4		
Nelson	Canada	3050	1/30	47	13.2	13.9	13.2	12.0		
Schweitzer Bowl	16A6	4500	12/30	49	15.3	9.3	14.0	--		
			1/28	86	28.5	21.3	23.3	--		
Schweitzer Ridge	16A5	6100	12/30	73	23.0	13.2	21.3	--		
			1/28	121	39.2	29.2	38.3	--		
Winchester Creek	17A3	2970	1/27	29	6.5	9.8	14.0	9.9*		
<u>KETTLE RIVER</u>										
Boulder Road	18A2	1450	10/26	0	0.0	0.0	0.0	--		
			11/10	0	0.0	0.0	0.0	--		
			11/28	0	0.0	0.0	0.0	--		
			12/12	0	0.0	0.0	0.0	--		
			12/28	0	0.0	3.4	3.0	--		
			1/12	7	1.6	4.4	6.9	--		
			1/27	10	2.0	5.6	7.1	--		
Big White Mountain	Canada	5500	1/28	58	17.9	--	--	--		

# Not located directly on this drainage

\* Adjusted 1948-62 average



## APPENDIX 2

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			1967		:Past Record			
			Date of Survey	Snow Depth (In.)	Water Content: (In.)	Water Content: 1966	1965	Avg.
<u>KETTLE RIVER (Cont.)</u>								
Butte Creek	18A3	4070	10/26	0	0.0	0.0	0.0	--
			11/10	0	0.0	0.0	1.2	--
			11/28	6	1.3	0.6	1.3	--
			12/12	20	4.6	1.7	3.1	--
			12/28	17	4.4	4.0	5.5	--
			1/12	26	6.4	5.5	9.1	--
			1/27	26	6.5	7.4	9.7	--
Cabin Creek	18A8	3170	10/26	0	0.0	0.0	0.0	--
			11/10	0	0.0	0.0	0.5	--
			11/28	2	0.6	0.0	0.0	--
			12/12	14	3.0	1.0	3.1	--
			12/28	12	3.3	3.5	5.1	--
			1/12	20	4.8	5.0	8.2	--
			1/27	22	5.3	5.6	9.4	--
Carmi Farron	Canada	4100	2/1	22	6.7	3.5	7.5	--
	Canada	4000	1/31	38	11.6	10.7	13.5	10.1
Goat Creek	18A4	3595	10/26	0	0.0	0.0	0.0	--
			11/10	0	0.0	0.0	0.5	--
			11/28	0	0.0	0.0	0.6	--
			12/12	15	3.0	0.6	2.6	--
			12/28	11	2.4	3.5	4.7	--
			1/12	19	4.4	4.7	7.3	--
			1/27	21	5.0	5.5	8.2	--
Lower Trapping Creek	Canada	3050	1/30	18	5.1	3.6	--	--
Monashee Pass	Canada	4500	1/31	40	11.8	10.9	9.7	9.5**
Old Glory Mtn	Canada	7000	1/30	79	13.0	17.5	24.0	17.9**
Snow Caps Creek	18A5	2150	10/26	0	0.0	0.0	0.0	--
			11/10	0	0.0	0.0	0.0	--
			11/28	0	0.0	0.0	0.0	--
			12/12	0	0.0	0.0	1.3	--
			12/28	0	0.0	3.0	3.3	--
			1/12	7	1.5	4.3	6.8	--
			1/27	9	2.0	4.8	7.2	--

\*\* Average for years of record



## APPENDIX 3

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			1967		:Past Record			
			Date of Survey (In.)	Snow Depth (In.)	Water Content (In.)	Water Content (In.)	1948-62	
<u>KETTLE RIVER (Cont.)</u>								
Snow Caps Trail	18A6	2720	10/26	0	0.0	0.0	0.0	--
			11/10	0	0.0	0.0	0.0	--
			11/28	0	0.0	0.0	0.0	--
			12/12	7	1.7	0.5	1.9	--
			12/28	5	1.3	3.1	4.1	--
			1/12	11	2.4	4.4	6.6	--
			1/27	15	3.5	5.2	7.2	--
Summit G. S.	18A7	4600	10/26	0	0.0	0.0	0.0	--
			11/10	0	0.0	0.0	0.8	--
			11/28	6	1.6	0.8	1.2	--
			12/12	18	3.9	2.1	3.1	--
			12/28	17	4.1	3.6	5.0	--
			1/12	24	6.1	5.4	7.8	--
			1/27	25	6.3	6.5	9.3	--
Upper Trapping Cr.	Canada	5500	1/29	33	8.0	5.6	--	--
<u>COLVILLE RIVER</u>								
Baird	17A6	3215	1/31	18	4.6	6.1	8.6	--
Carlson	18A9	2885	1/26	10	2.3	5.1	6.6	--
Chewelah	17A4	4925	1/30	38	11.5	16.9	18.5	--
Stranger Mountain	17A5	4990	1/27	25	6.6	13.0	16.0	--
Togo	18A10	3370	1/26	17	3.1	11.1	14.7	
<u>SPOKANE RIVER</u>								
Forty-nine Mdws.+	15B3A	5000	2/1	85	26.4	21.3	28.0	--
4th of July Summit	16B3	3100	12/29	10	2.0	6.6	4.7	--
			1/31	20	4.8	8.3	8.9	--
Granite Peak	15B13A	6000	2/7	114	33.1	28.3	40.9	--
#Lookout	15B2	5250	12/29	56	15.6	12.5	17.6	17.6*
			1/31	94	29.2	21.6	27.7	26.4
Lost Lake +	15B14A	6000	1/30	131	40.7	28.0	49.1	--
Medicine Ridge +	15B4A	6150	2/7	139	40.3	35.0	46.4	--
Outlaw Creek +	15B12A	3750	2/1	39	11.5	12.4	11.6	--
Sherwin	16C1	3200	1/28	34	10.0	10.0	12.4	--

# Not located directly on this drainage

\* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia observation



## APPENDIX 4

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT						
			1967		:P a s t R e c o r d				
			Date of Survey	Snow Depth	Water Content: (In.)	Water Content: (In.)	1948-62	1966	1965
<u>OKANOGAN RIVER</u>									
Aberdeen Lake	Canada	4300	1/31	21	5.0	6.3	5.7	5.0**	
Blackwall Mountain	Canada	6250	1/30	81	26.6	25.2	24.8	22.7**	
Brookmere	Canada	3200	1/29	32	7.6	8.0	6.3	7.3**	
Clark +	19A8a	7000	1/30	63	19.5	--	--	--	
Copper Mountain	Canada	4300	1/29	16	4.3	--	--	5.3**	
Enderby	Canada	6250	1/27	96	34.4	20.9	19.9	--	
Hamilton Hill	Canada	4900	1/28	47	13.9	13.1	--	9.4**	
#Harts Pass	20A5A	6500	1/31	111	36.3	26.0	30.8	31.1*	
#Horseshoe Basin +	19A5a	7000	1/30	48	14.9	--	--	--	
Isintok Lake	Canada	5510	1/30	28	7.4	4.3	--	--	
Lost Horse Mountain	Canada	6300	1/29	29	8.1	4.6	5.5	5.7**	
#Loup Loup	19A7	4650	1/30	28	7.5	6.1	8.0	--	
Lower Esperon Creek	Canada	4270	1/31	37	10.2	5.9	--	--	
McCulloch	Canada	4200	1/30	23	5.8	4.6	5.2	5.0	
Middle Esperon Cr.	Canada	4580	1/31	41	12.4	8.5	--	--	
Missezula Mountain	Canada	5100	2/1	32	9.2	7.5	5.4	5.8**	
Mission Creek	Canada	6000	1/29	55	17.7	10.5	14.3	12.0**	
Monashee Pass	Canada	4500	1/31	40	11.8	10.9	9.7	9.5**	
Mount Kobau	Canada	5950	1/30	40	12.0	--	--	--	
Muckamuck +	19A9a	6390	1/30	50	15.5	--	--	--	
Mutton Creek No. 1	19A1	5700	1/30	53	16.0	9.7	10.0	9.6*	
Mutton Creek No. 2	19A4	6000	1/30	51	16.6	9.4	11.2	10.0*	
New Copper Mountain	Canada	4300	1/29	18	5.1	5.6	5.9	5.4**	
Paysayten +	20A28a	4300	1/30	54	17.8	--	15.6	--	
Postill Lake	Canada	4500	1/30	26	7.0	5.8	5.7	5.7**	
Rusty Creek	19A3	4000	1/31	23	5.6	6.7	5.8	6.0	
Salmon Meadows	19A2	4500	1/30	40	6.4	6.0	9.0	7.7*	
Silver Star Mtn.	Canada	6050	1/30	76	25.7	16.6	17.7	14.9**	
Starvation Mtn. +	19A10a	6750	1/30	63	19.5	--	--	--	
Summerland Reservoir	Canada	4200	1/28	33	8.8	6.5	--	--	
Touts Coulee	19A6	2845	1/30	8	2.3	3.1	4.2	--	
Trout Creek	Canada	4700	2/2	26	5.6	5.5	5.7	5.7	
Upper Esperon Cr.	Canada	5290	Not Measured			10.2	--	--	
#Quartette Lake	Canada	4000	1/30	33	8.1	--	--	--	

# Not located directly on this drainage

\* Adjusted 1948-62 average

\*\* Average for years of record

+ Snow water equivalent estimated from aerial stadia observation



## APPENDIX 5

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT						
			1967		:Past Record				
			Date of Survey (In.)	Snow Depth (In.)	Water Content (In.)	Water Content (In.)	1948-62	1965	Avg.

METHOW RIVER

Billy Goat Pass +	20A10a	6409	1/30	114	37.6	--	23.4	--
Dollar Watch +	20A29a	7000	1/30	78	25.7	--	18.7	--
Harts Pass	20A5A	6500	1/31	111	36.3	26.0	30.8	31.1*
Horseshoe Basin +	19A5a	7000	1/30	48	14.9	--	--	--
Loup Loup	19A7	4650	1/30	28	7.5	6.1	8.0	--
#Mutton Creek No. 1	19A1	5700	1/30	53	16.0	9.7	10.0	9.6*
#Mutton Creek No. 2	19A4	6000	1/30	51	16.6	9.4	11.2	10.0*
#Rusty Creek	19A3	4000	1/31	23	5.6	6.7	5.8	6.0
#Salmon Meadows	19A2	4500	1/30	40	6.4	6.0	9.0	7.7*
War Creek Pass +	20A31a	6500	Not Measured					

CHELAN LAKE BASIN

Cloudy Pass +	20A22a	6500	1/24	104	26.0	--	--	--
			1/30	114	36.5	--	29.0	29.7*
Greenwood Flat +	20A25a	3540	Not Measured			--	20.0	23.6*
Little Meadows +	20A24a	5275	1/30	120	38.4	--	30.7	31.6*
Lyman Lake	20A23A	5900	1/24	147	36.8	--	--	--
			1/30	158	50.6	--	37.7	--
Park Creek Flat +	20A13a	2220	1/24	82	20.5	--	--	--
			1/30	86	27.5	--	27.8	--
Park Creek Ridge	20A12A	4600	1/24	134	33.5	--	--	--
			1/30	146	46.7	--	33.9	--
Petersons +	20A16a	3730	1/30	102	32.6	--	28.4	--
Rainy Pass	20A9	4780	1/31	111	36.0	24.3	28.9	29.8*
Safety Harbor	20A30A	6300	1/30	83	20.8	--	24.1	--

ENTIAT RIVER

Brief	20B19	1600	1/28	15	5.0	6.8	8.6	--
Entiat Meadows +	20A33a	4800	1/30	116	26.4	--	--	--
Entiat River Trail +	20A34a	3150	1/30	60	13.7	--	--	--
Fox Camp +	20A36a	6510	1/30	137	31.2	New Aerial Marker		
Pope Ridge	20B20	4300	1/26	50	11.4	14.4	--	--
Pugh Ridge +	20A32a	6400	1/30	73	16.6	--	--	--
Snow Brushy +	20A35a	3850	1/30	83	18.9	--	--	--
Tommy Creek +	20B21a	5300	1/30	70	16.0	--	--	--

# Not directly on this drainage

\* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia observation



## APPENDIX 6

DRAINAGE BASIN and SNOW COURSE <u>WENATCHEE RIVER</u>	No.	Elev.	SNOW COVER MEASUREMENT					
			1967		:Past Record			
			Date of Survey	Snow Depth (In.)	Water Content (In.)	1966	1965	Avg.
Berne-Mill Cr.	21B23	2925	11/15	8	1.8	0.0	1.0	--
			11/28	14	2.5	1.4	4.8	--
			12/15	32	7.7	2.0	9.8	--
			12/29	26	7.8	5.0	14.8	--
			1/16	42	13.0	15.1	19.7	--
			1/30	55	18.8	17.8	24.7	--
Berne-Mill Cr. New	21B41SP	3240	11/15	8	2.3	--	--	--
			11/28	13	2.0	--	--	--
			11/29	21	6.8	--	--	--
			1/30	50	17.2	--	--	--
Blewett Pass No. 2	20B2	4270	12/31	6	1.9	7.6	9.6	8.1*
			1/29	25	8.2	12.7	18.0	12.4*
Chiwaukum G. S.	20B16	1810	11/15	4	0.8	0.0	0.6	--
			11/28	0	0.0	0.2	1.6	--
			12/15	10	2.0	0.4	3.7	--
			12/29	6	1.6	2.3	7.8	--
			1/16	14	3.8	7.8	10.9	--
			1/30	21	6.4	8.4	14.4	--
Lake Wenatchee	20B5	1970	11/15	4	1.0	0.0	0.0	--
			11/28	0	0.0	0.6	1.3	--
			12/15	13	2.1	1.1	4.6	--
			12/29	8	2.1	3.1	8.5	--
			1/16	20	5.7	9.9	12.4	--
			1/30	32	9.3	10.6	15.4	--
Leavenworth R. S.	20B17	1127	10/31	0	0.0	0.0	0.0	--
			11/15	1	0.3	0.0	0.0	--
			11/25	0	0.0	0.5	0.0	--
			12/12	9	1.1	0.0	0.5	--
			12/30	0	0.0	3.0	4.2	--
			1/11	0	0.0	7.3	6.1	--
			1/27	10	2.0	7.3	8.1	--
#Lyman Lake +	20A23A	5900	1/24	147	36.8	--	--	--
			1/30	158	50.6	--	37.7	--

# Not directly on this drainage

\* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia observation



## APPENDIX 7

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			1967		:P a s t R e c o r d			
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content (In.)	1966	1965
<u>WENATCHEE RIVER (Cont.)</u>								
Merritt	20B18	2140	11/15	4	0.5	0.0	0.0	--
			11/28	5	0.5	0.5	2.2	--
			12/15	18	3.3	2.0	6.3	--
			12/29	11	3.5	4.2	11.5	--
			1/16	16	4.9	12.0	16.8	--
			1/30	30	9.2	13.4	18.6	--
Stevens Pass	21B1	4070	11/15	16	3.4	0.0	1.8	--
			11/28	28	5.2	4.4	6.9	11.6*
			12/15	52	13.9	7.8	15.6	15.2*
			12/29	48	15.2	13.2	34.1	21.8*
			1/16	90	24.4	28.5	34.6	27.5*
			1/30	106	33.7	31.2	44.6	34.9
<u>SQUILCHUCK CREEK</u>								
Beehive Springs	20B3	4400	1/30	7	2.9	7.7	7.1	5.5*
Scout-A-Vista	20B4	3400	1/31	7	3.0	7.0	7.8	6.1*
<u>STEMILT CREEK</u>								
Jump-Off	20B8	4450	1/30	6	2.4	8.0	7.4	--
Stemilt Slide	20B6	5000	1/30	25	7.7	12.0	11.7	--
Upper Wheeler	20B7	4400	1/30	6	2.6	9.0	9.9	--
<u>YAKIMA RIVER</u>								
#Ahtanum R. S.	21C11	3100	12/27	8	1.8	3.3	5.8	4.3*
			1/27	12	2.9	8.1	10.1	6.5*
Blewett Pass No. 2	20B2	4270	12/31	6	1.9	7.6	9.6	8.1*
			1/29	25	8.2	12.7	18.0	12.4*
#Cayuse Pass	21C6	5300	1/7	120	38.2	25.6	--	--
			1/30	196	67.1	53.3	63.9	60.3*
Clockum Pass	20B9	5370	2/1	34	9.7	--	--	--
Cooke Creek	20B10	4123	2/1	6	1.8	7.3	--	--
Grouse Camp	20B11	5385	1/31	37	10.2	12.6	--	--
High Creek	20B12	2930	1/31	0	0.0	6.9	6.6	--

# Not directly on this drainage

\* Adjusted 1948-62 average



## APPENDIX 8

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT						
			1967		:Past Record				
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content: 1948-62	1966	1965	Avg.
<u>YAKIMA RIVER (Cont.)</u>									
Lake Cle Elum	21B14M	2200	12/9	10	1.1	--	--	--	--
			12/19	0	0.0	--	2.0	--	--
			12/29	0	0.0	2.0	8.0	4.9	
			1/21	13	2.5	7.8	9.7	--	
			1/30	10	3.0	8.4	12.2	8.9	
Manashtash	20C1	3935	1/27	14	2.8	4.5	4.9	--	
Morse Lake	21C17	5400	1/30	146	51.1	32.4	45.4	39.8*	
Nanum	20B13	3875	1/31	10	3.1	10.3	--	--	
#Olallie Meadows	21B2	3625	1/27	72	28.1	33.0	45.3	30.1*	
#Satus Pass	20D1	4030	1/31	13	4.3	17.1	14.6	--	
Snoqualmie Pass	21B10SP	3020	11/29	8	2.0	--	--	--	
			12/15	20	7.2	--	--	--	
			12/30	25	8.4	--	--	--	
#Stampede Pass	21B10	3000	11/15	7	1.8	0.0	1.1	--	
			11/22	10	4.4	--	--	--	
			12/2	14	5.2	2.2	5.2	--	
			12/13	36	8.5	3.4	12.1	--	
			12/20	24	7.5	--	--	--	
			1/3	50	14.5	12.1	19.1	20.7*	
			1/10	65	15.8	--	--	--	
			1/17	70	19.1	16.7	23.7	25.1*	
			1/20	92	26.1	--	--	--	
			1/31	82	27.6	18.0	37.7	33.6*	
Trail Creek	20B14	3360	2/1	0	0.0	5.4	--	--	
Tunnel Avenue	21B8	2450	12/12	19	2.8	--	--	--	
			12/20	7	2.0	--	7.5	--	
			12/29	11	3.4	5.1	14.5	10.0	
			1/10	18	5.3	--	--	--	
			1/20	43	9.1	16.4	20.5	--	
			1/30	36	10.7	17.3	24.8	18.7	
Walters Flat	20B15	3360	1/31	5	1.8	8.1	8.5	--	

# Not directly on this drainage

\* Adjusted 1948-62 average



## APPENDIX 9

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT						
			1967		:Past Record				
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content: 1966	1965	Avg.	1948-62
<b><u>YAKIMA RIVER (Cont.)</u></b>									
White Pass (E Side)	21C28	4500	1/5	39	7.9	--	18.1	--	
			1/17	37	11.7	13.4	18.7	--	
			1/31	49	15.6	16.1	24.3	18.5*	
White Pass (Leech L)	21C27	4500	1/7	45	12.6	11.8	18.8	--	
			1/17	49	14.1	--	--	--	
			1/30	58	21.4	21.6	29.2	--	
<b><u>AHTANUM CREEK</u></b>									
Ahtanum R. S.	21C11	3100	12/27	8	1.8	3.3	5.8	4.3*	
			1/27	12	2.9	8.1	10.1	6.5*	
<b><u>ASOTIN CREEK</u></b>									
Spruce Springs	17C4	5700	1/26	48	14.8	15.7	24.6	--	
<b><u>MILL CREEK</u></b>									
Homestead	17C1	4030	1/27	21	5.8	9.4	8.9	7.0*	
Martin Springs	17C2	4400	1/27	31	9.1	12.0	13.2	8.3*	
Walla Walla Diversion	18C13	2400	12/26	0	0.0	0.0	1.0	0.0*	
			1/26	0	0.0	4.0	2.0	2.0*	
<b><u>KLICKITAT RIVER</u></b>									
Satus Pass	20D1	4030	1/31	13	4.3	17.1	14.6	--	
West Fork Cabin	21C15	3000	1/31	12	4.2	14.7	18.1	--	
<b><u>WHITE SALMON RIVER</u></b>									
Cultus Creek	21C12	4000	12/29	52	18.1	--	20.1	17.1*	
#Surprise Lakes	21C13A	4250	2/2	95	36.3	36.2	39.9	30.1*	
			12/29	54	18.2	23.8	22.7	21.0*	
			2/2	106	37.7	37.8	43.0	32.8*	

# Not located directly on this drainage

\* Adjusted 1948-62 average



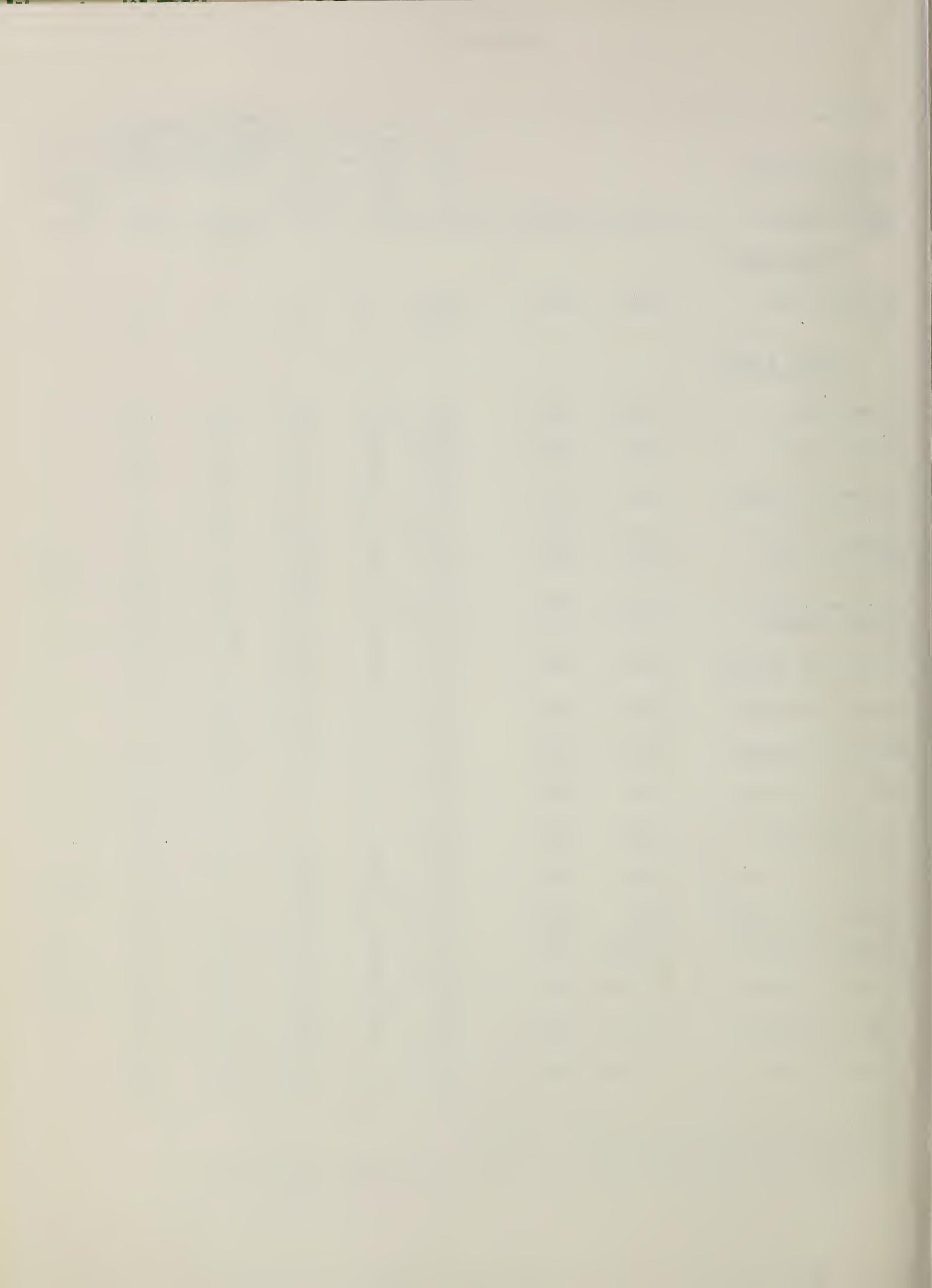
## APPENDIX 10

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT							
			1967		:Past Record					
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content: 1966	1965	Avg.	1948-62	
<u>WIND RIVER</u>										
Old Man Pass	21D19	3100	12/30 1/31	19 29	1.9 10.9	-- 27.8	-- 25.4	-- --	-- --	
<u>LEWIS RIVER</u>										
Blue Lake +	21C22a	4800	1/1 1/30	104 168	36.4 64.0	41.0 57.3	-- 62.8	-- --	-- --	
Bob's Trail	21C21	2200	12/29 2/1	16 35	2.4 12.3	16.6 20.6	9.9 18.8	-- --	-- --	
Calamity Ridge +	22D1a	2500	1/1 1/31	0 0	0.0 0.0	7.8 12.4	-- 4.8	-- --	-- --	
Council Pass + #Cultus Creek	21C18a 21C12	4200 4000	1/30 12/29 2/2	77 52 95	29.3 18.1 36.3	33.3 -- 36.2	34.0 20.1 39.9	-- 17.1* 30.1*	-- -- --	
Divide Meadow + Grand Meadow	21C29a 21C25	5600 3500	1/30 12/28 2/1	112 22 52	42.6 2.2 17.0	36.3 15.1 22.3	48.4 14.2 26.6	-- -- --	-- -- --	
Lone Pine Shelter	21C26	3800	1/6 1/31	60 88	17.0 33.2	-- 36.4	-- 38.0	-- --	-- --	
Marble Mountain +	22C5a	3200	1/1 1/30	23 42	3.3 16.8	16.7 30.3	-- 21.6	-- --	-- --	
#Mosquito Meadows	21C19	4100	1/6 1/31	63 89	17.1 34.9	28.7 36.9	-- 41.3	-- --	-- --	
New Muddy River	22C6	1400	1/6 1/31	13 6	1.9 2.4	7.2 20.0	13.5 19.2	-- --	-- --	
Old Man Pass	21D19	3100	12/30 1/31	19 29	1.9 10.9	-- 27.8	-- 25.4	-- --	-- --	
Plains of Abraham +	22C1a	4400	1/1 1/30	86 138	30.1 52.5	-- --	-- 44.4	-- 39.4*	23.2*	
Smith Creek Road	22C4	2100	1/31	33	15.1	25.7	30.1	-- --	-- --	
Spencer Meadow +	21C20a	3400	1/1 1/30	31 46	4.9 17.5	19.2 29.6	-- 18.4	9.4* 9.4*	9.4*	
Surprise Lakes	21C13A	4250	12/29 2/2	54 106	18.2 37.7	23.8 37.8	22.7 43.0	21.0* 32.8*	-- --	
Table Mountain +	21C24a	4200	1/1 1/30	55 91	18.5 34.6	25.5 36.8	-- 40.4	-- --	-- --	
Timbered Peak +	21D18a	3000	1/1 1/31	14 26	1.5 10.0	14.3 24.6	-- 12.0	-- --	-- --	

# Not located directly on this drainage

\* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia observation



## APPENDIX 11

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT						
			1967		:P a s t R e c o r d				
			Date of Survey (In.)	Snow Depth (In.)	Water Content: (In.)	Water Content: (In.)	1966	1965	Avg.
<u>COWLITZ RIVER</u>									
Cayuse Pass	21C6	5300	1/7	120	38.2	25.6	--	--	
			1/30	196	67.1	53.3	63.9	60.3*	
Mosquito Meadows	21C19	4100	1/6	63	17.1	28.7	--	--	
			1/31	89	34.9	36.9	41.3	--	
Ohanapecosh	21C32	2200	1/4	10	3.3	--	--	--	
			1/27	36	10.8	16.0	20.8	--	
Packwood Lake	21C31	2870	1/5	16	3.3	9.5	--	--	
			1/26	31	8.0	13.6	14.8	--	
Pigtail Peak	21C33	5900	1/7	95	28.4	26.7	37.0	--	
			1/30	135	46.3	40.2	59.0	--	
Plains of Abraham +	22C1a	4400	1/1	86	30.1	--	--	23.2*	
			1/30	138	52.5	--	44.4	39.4*	
Potato Hill	21C14	4500	1/6	48	10.5	--	--	--	
			1/31	63	22.2	26.1	29.9	19.7*	
#White Pass (E Side)	21C28	4500	1/5	39	7.9	--	18.1	--	
			1/17	37	11.7	13.4	18.7	--	
			1/31	49	15.6	16.1	24.3	18.5*	
#White Pass (Leech L)	21C27	4500	1/7	45	12.6	11.8	18.8	--	
			1/17	49	14.1	--	--	--	
			1/30	58	21.4	21.6	29.2	--	
Willame Creek	21C30	3250	1/5	41	9.6	--	--	--	
			1/31	60	22.7	24.6	28.5	--	
<u>PUGET SOUND DRAINAGE</u>									
<u>NISQUALLY RIVER</u>									
Ghost Forest	21C4	4550	12/27	33	10.2	12.1	--	--	
			1/30	106	37.5	31.3	37.3	30.6*	
Longmire	21C3	2760	12/27	2	0.2	2.0	--	--	
			1/30	25	8.6	8.8	13.8	9.5*	
New Paradise Park	21C35	5500	12/27	58	20.5	18.4	--	--	
			1/30	158	59.8	39.2	--	--	
Stem Glade	21C1	5050	12/27	70	24.3	17.4	--	--	
			1/30	170	60.4	39.8	56.2	48.4*	

# Not located directly on this drainage

\* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia observation



## APPENDIX 12

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT						
			1967		:Past Record				
			Date of Survey (In.)	Snow Depth (In.)	Water Content: (In.)	Water Content (In.)	1948-62 1966	1965	Avg.
<u>WHITE RIVER</u>									
#Cayuse Pass	21C6	5300	1/7	120	38.2	25.6	--	--	
			1/30	196	67.1	53.3	63.9	60.3*	
White River Campground	21C34	4000	12/27	23	7.3	10.3	--	--	
			2/2	63	20.6	21.8	--	--	
<u>GREEN RIVER</u>									
Airstrip	21B24	1800	12/2	0	0.0	0.0	0.0	--	
			12/27	0	0.0	2.2	4.9	--	
			1/30	5	1.2	7.2	7.2	--	
Charley Creek	21B25	1200	12/2	0	0.0	0.0	0.0	--	
			12/27	0	0.0	3.1	4.1	--	
			1/30	0	0.0	4.3	0.0	--	
Grass Mtn. No. 1	21B26	4000	12/2	0	0.0	2.4	4.3	--	
			12/27	6	0.7	7.1	12.2	--	
			2/2	36	12.5	17.0	17.0	--	
Grass Mtn. No. 2	21B27	2900	12/2	0	0.0	1.3	4.4	--	
			12/27	8	1.7	--	11.6	--	
			1/30	Not Measured		17.8	18.5	--	
Grass Mtn. No. 3	21B28	2100	12/2	0	0.0	0.0	0.0	--	
			12/27	0	0.0	--	4.1	--	
			1/30	0	0.0	6.2	3.7	--	
Lester Creek	21B29	3100	12/2	0	0.0	1.6	3.8	--	
			12/27	13	3.2	7.1	13.1	--	
			1/30	45	13.5	15.6	19.8	--	
Sawmill Ridge	21B29	4700	12/2	16	4.3	2.7	6.4	--	
			12/27	28	8.6	7.9	--	--	
			1/30	84	27.9	20.3	32.6	--	
Twin Camp	21B30	4100	12/2	5	2.0	1.8	4.2	--	
			12/27	14	4.3	6.2	13.3	--	
			1/30	48	17.6	14.8	26.0	--	
Stampede Pass	21B10	3000	11/15	7	1.8	0.0	1.1	--	
			11/22	10	4.4	--	--	--	
			12/2	14	5.2	2.2	5.2	--	
			12/13	36	8.5	3.4	12.1	--	
			12/20	24	7.5	--	--	--	
			1/3	50	14.5	12.1	19.1	20.7*	
			1/10	65	15.8	--	--	--	
			1/17	70	19.1	16.7	23.7	25.1*	
			1/20	92	26.1	--	--	--	
			1/31	82	27.6	18.0	37.7	33.6*	

# Not directly on this drainage

\* Adjusted 1948-62 average



## APPENDIX 13

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			1967		:P a s t R e c o r d		1948-62	1965
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content: 1966		
<u>SNOQUALMIE RIVER</u>								
Olallie Meadows	21B2	3625	1/27	72	28.1	33.0	45.3	30.1*
<u>SKYKOMISH RIVER</u>								
#Stevens Pass	21B1	4070	11/15	16	3.4	0.0	1.8	--
			11/28	28	5.2	4.4	6.9	11.6*
			12/15	52	13.9	7.8	15.6	15.2*
			12/29	48	15.2	13.2	34.1	21.8*
			1/16	90	24.4	28.5	34.6	27.5*
			1/30	106	33.7	31.2	44.6	34.9
<u>SKAGIT RIVER</u>								
#Cloudy Pass +	20A22A	6500	1/24	104	26.0	--	--	--
			1/30	114	36.5	--	29.0	29.7*
Devils Park	20A4	5900	1/31	116	38.6	26.5	29.7	31.9*
#Harts Pass	20A5A	6500	1/31	111	36.3	26.0	30.8	31.1*
Klesilkwa	Canada	3700	1/31	30	9.3	--	8.6	10.7*
#Lyman Lake +	20A23A	5900	1/24	147	36.8	--	--	--
			1/30	158	50.6	--	37.7	--
New Tashme	Canada	2500	1/31	20	7.0	10.7	10.2	7.8
#Rainy Pass	20A9	4780	1/31	111	36.0	24.3	28.9	29.8*
#Quartette Lake	Canada	4000	1/30	33	8.1	--	--	--
<u>BAKER RIVER</u>								
Dock Butte +	21A11A	3800	1/30	123	47.0	45.8	40.3	--
Easy Pass +	21A7A	5200	1/30	177	64.2	52.2	48.0	--
Jasper Pass +	21A6A	5400	1/30	227	81.5	56.0	59.3	--
Marten Lake +	21A9A	3600	1/30	170	65.5	57.4	60.0	--
Mount Blum +	21A18a	5800	1/30	168	58.8	55.3	60.0	--
#Panorama	21A5	4300	1/12	134	47.4	53.9	45.8	--
			1/27	185	69.6	51.5	53.8	--
Rocky Creek	21A12A	2100	1/30	58	23.2	22.4	28.0	--
Schreibers Meadow +	21A10A	3400	1/30	120	46.4	36.8	41.8	--
S. F. Thunder Creek +	21A14A	2200	1/30	6	2.4	13.3	10.1	--
Watson Lakes +	21A8A	4500	1/30	124	46.3	49.0	46.7	--

# Not directly on this drainage

\* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia observation



## APPENDIX 14

DRAINAGE BASIN and SNOW COVER	No.	Elev.	SNOW COVER MEASUREMENT						
			1967		:Past Record				
			Date of Survey (In.)	Snow Depth (In.)	Water Content (In.)	Water Content: 1966	1965	Avg.	1948-62
<u>NOOKSACK RIVER</u>									
Panorama	21A5	4300	1/12	134	47.4	53.9	45.8	--	
			1/27	185	69.6	51.5	53.8	--	
<u>OLYMPIC PENINSULA</u>									
<u>DUNGENESS RIVER</u>									
Deer Park	23B4	5200	1/27	74	19.9	18.3	14.9	18.0*	
<u>MORSE CREEK</u>									
Deer Park G. S.	23B13	4850	1/27	48	11.9	14.8	14.1	--	
Morse Creek	23B12	5425	1/30	135	31.2	32.6	29.5	--	
<u>ELWHA RIVER</u>									
Hurricane	23B3	4500	1/30	72	22.1	17.0	18.9	--	
<u>SKOKOMISH RIVER</u>									
Black & White	23B7	4200	1/5	68	16.8	--	--	--	
			1/30	101	35.2	33.5	32.8	--	
Black & White Lakes	23B6	4700	1/5	94	28.9	--	--	--	
			1/30	135	54.1	45.9	38.5	40.0*	
Four Streams	23B10	3000	1/5	40	9.8	--	--	--	
			1/30	65	24.9	24.4	26.4	--	
Home Sweet Home	23B5	5200	1/5	126	40.2	--	--	--	
			1/30	176	65.2	52.7	47.8	--	
Sundown Pass	23B8	3900	1/30	118	48.0	44.1	42.4	--	

\* Adjusted 1948-62 average



# Agencies Assisting with Snow Surveys

## GOVERNMENT AGENCIES

### Canada:

Department of Lands, Forests and Water Resources,  
Water Resources Service, British Columbia

### States:

Washington State Department of Conservation  
Washington State Department of Natural Resources

### Federal:

Department of the Army  
Corps of Engineers  
U. S. Department of Agriculture  
Forest Service  
U. S. Department of Commerce  
Weather Bureau  
U. S. Department of the Interior  
Bonneville Power Administration  
Bureau of Reclamation  
Geological Survey  
National Park Service

## PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.  
Pacific Power and Light Company  
Puget Sound Power and Light Company  
Washington Water Power Company

## OTHER PUBLIC AGENCIES

Okanogan Irrigation District  
Wenatchee Heights Irrigation District

## MUNICIPALITIES

City of Walla Walla  
City of Tacoma  
City of Seattle

*Other organizations and individuals furnish valuable information for  
snow survey reports. Their cooperation is gratefully acknowledged.*

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